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Cobalt-copper based catalysts for higher terminal alcohols synthesis via Fischer-Tropsch reaction

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**Perspective****Cobalt-copper based catalysts for higher terminal alcohols synthesis via Fischer-Tropsch reaction**

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**Abstract**

The production of higher terminal alcohols through CO hydrogenation according to the Fischer-Tropsch (F-T) process has been a topic of interest since the Institut Français du Pétrole (IFP) demonstrated short-chain C<sub>1</sub>–C<sub>6</sub> mixed alcohols production over cobalt-copper based catalysts. A number of catalyst formulations were screened for their suitability at that time. In particular, the addition of Cr, Zn, Al, Mn and V to CoCu was investigated. In a number of patents, it was shown that catalyst preparation is crucial in these catalyst formulations and that high alcohols selectivity can only be achieved by carefully respecting the procedures and recipes. This short critical review highlights recent developments in CoCu-based catalysts for higher terminal alcohols synthesis via F-T synthesis. Special attention will be given to catalyst preparation which according to developments in our group is based on oxalate precipitation. This way we show that the close association of Co and Cu on the one hand and promoter/dispersant on the other are of utmost importance to ensure high performance of the catalysts. We shall concentrate on “CoCuMn”, “CoCuMo” and “CoCuNb” catalyst formulations, all prepared via oxalate precipitation and combined with “entrainment techniques” if necessary, and show high total alcohols selectivity can be obtained with tunable Anderson-Schulz-Flory chain-lengthening probability. Either long-chain C<sub>8</sub>–C<sub>14</sub> terminal alcohols as feedstock for plasticizers, lubricants and detergents, or short-chain C<sub>2</sub>–C<sub>5</sub> alcohols as “alkanol” fuels or fuel additives can be formed this way.

**Key words:** Higher terminal alcohols; Fischer-Tropsch; Cobalt-copper; Oxalate; Promoter

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